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ABSTRACT

The pamphlet provides basic information on learning disabilities due to minimal brain dysfunction (MBD). Topics considered include terminology, incidence, symptoms, causes and prevention, diagnosis, family role for MBD children, and research in learning disabilities due to MBD. (CL)

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# learning disabilities due to Minimal Brain Dysfunction

## hope through research

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The child with learning disabilities due to minimal brain dysfunction can be found, and he can be helped. This is not easy. Who is he? How best shall he be helped? These questions challenge professionals and parents. No one medicine or treatment or program helps each such child.

In recent years more of these children are being found and helped by persons who are convinced that this is important for the child and the Nation. Otherwise, mild or minimal or minor difficulties in brain function may create a serious problem for the affected child, his family, playmates, and teachers. Problems unsolved in childhood may impede adjustment in adult life.

The child with learning disabilities due to minimal brain dysfunction (MBD) has normal or potentially normal mental ability, adequate vision, hearing, and adequate coordination and emotional adjustment. To say it the other way, his basic problem is not mental retardation, poor vision, partial deafness, emotional illness, or cerebral palsy, although these complications sometimes make the problem more difficult.

Yet the child is unable to learn in the ordinary school situation. He often has difficulty with language, reading, writing, spelling, arithmetic, or memory. He may have trouble understanding what others try to tell him. Any clumsiness in dressing, eating, and play may show up in school as awkwardness in handling a pencil.

Sometimes these children have difficulty learning to talk. This may lead to discovery of their problem and special education to correct it before they reach school age. However, many MBD children are not identified until they enter school.

EC 101 868

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## *what's in a name?*

Some 38 different terms for children with learning disabilities due to minimal brain dysfunction have been used. The terms have appeared in the many recent professional articles or the few pioneering professional books about these children. This bewildering confusion in names was uncovered by a grantee of the National Institute of Neurological and Communicative Disorders and Stroke (NINCDS) and of the Easter Seal Research Foundation of the National Easter Seal Society for Crippled Children and Adults, a voluntary health organization. (NINCDS is one of the National Institutes of Health, the principal Federal agency for biomedical research, communication of biomedical knowledge, and education for the health professions.)

A research group sponsored by these two organizations decided upon "minimal brain dysfunction in children" as the technical name for the widely differing problems. The word "minimal" rules out the graver forms of chronic brain dysfunction (poor functioning) such as cerebral palsy and epilepsy.

Doctors have substituted "cerebral" for "brain" in "minimal cerebral dysfunction." "Syndrome" means a set of symptoms; words have been placed like a series of lenses in an attempt to sharpen the picture, for example, "minimal chronic brain syndrome of children."

The "neurologically handicapped child" is used occasionally, but could refer to any child with a neurological ailment.

Striving for an exact name, specialists coined the expression, "the child with psychoneurological learning disabilities." This points to a disturbance in learning which may be accompanied by misbehavior because the same factor has damaged both the learning and the behavior systems in the brain. Or, the child's behavior may cause no difficulty until he enters school and cannot learn as his classmates do. Then, extreme frustration is likely to lead him into troublesome actions.

"Brain-injured" and "brain-damaged" have been used to describe these children; however, no

actual injury or damage in the brain can be found in many of them. Another term with an identical or overlapping meaning is "perceptually handicapped children," already with its own initials, "the PH child." These children often but not always confuse such perceptions as right or left, up or down, or shapes of geometrical figures. They may misbehave because they do not "perceive" the similarity of a new situation to a familiar one for which they have been taught appropriate behavior.

Children with learning disability due to minimal brain dysfunction may be classified into subgroups according to a conspicuous symptom. Examples are the underactive (hypoactive), or the overactive (hyperkinetic). Subgroups with a special language problem may be called "language confused" or "language disturbed," or said to have "developmental dyslexia."

## *why "children"?*

"*Children* with learning disabilities" may grow up to become normal adults:

—If, through special teaching methods, they can learn

—If, through medical care, some physical trouble is controlled

—If they enter an environment within which their handicap does not interfere with daily living and work.

For some children, intensive educational help may be required in special institutions. This will assist them in avoiding the ranks of the school dropouts, and in attaining a happy creative life instead of an unhappy unproductive life.

Children with learning disabilities due to MBD are a too newly recognized problem for an exact prediction of their future. A long-range study supported by the National Institute of Neurological and Communicative Disorders and Stroke (NINCDS) may bring encouraging answers. In the NINCDS study, children whose medical histories began with the history of their mothers early in pregnancy now are entering grade school. From observation of these individuals, some

questions of what becomes of "children with learning disabilities due to MBD" may be answered. In some special classes for MBD children is an occasional MBD adult with normal or superior intelligence who is learning to read, write, and perform the arithmetic necessary in modern living.

Because MBD affects children, another of the National Institutes of Health, the National Institute of Child Health and Human Development, also is concerned with research on MBD.

## *how many affected children?*

Because of the difficulty of definition, and because minimal brain dysfunction is not a reportable ailment, no exact figures exist on the number of these children. One specialist estimates that about 5 percent of U.S. school children have learning disabilities due to slight irregularities of brain function (minimal brain dysfunction).

## *the symptoms are many*

The approximately 100 identified symptoms of minimal brain dysfunction are often bewildering and conflicting. They may be grouped as medical, behavioral, or educational.

*Medical symptoms,* by presently known methods of examination, have not been found in some children with learning difficulties typical of the child with MBD. In others, "soft neurological signs" have been discovered which are not severe enough to be considered an ailment.

One of the earliest symptoms to be noticed may be slowness or awkwardness of movement, or failure to develop a sense of right and left, up and down. Each child has his own rate of development, and parents often worry unnecessarily because a child does not keep up with his playmates in every detail. But if he is slow in many checkpoints, or quite slow in any one, this should be discussed with his doctor. Most children learn to walk by 12 to 20 months. Parents are wise to record the age of walking, feeding, undressing, dressing, teething, and other milestones about which the physician may inquire.

The child's hearing, vision, and voice may be

normal, but something in the brain centers of the MBD child may not understand the messages which his eyes and ears receive. Or his brain centers may not direct his tongue and lips to talk. Children ordinarily learn to understand speech and to talk by the age of 2 years.

*Behavioral symptoms* might include lack of normal attention, overactivity or underactivity, and unusual and changeable emotions. The extreme frustration, at times, of not being able to keep up with children their own age leads some MBD children into temper tantrums and aggressive behavior. The National Institute of Mental Health, part of the Health Services and Mental Health Administration, Department of Health, Education, and Welfare, has a program related to such MBD problems.

*Educational symptoms* often can be recognized through careful observation of difficulties with reading, spelling, writing, and arithmetic. More research is needed here, also.

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## *causes and prevention*

The causes of the symptoms of MBD can be either physical (organic) or environmental, or both. Both must be considered in the diagnosis and planning for the child. Often, no cause can be proved by present knowledge.

Efforts at prevention of MBD center around heredity, pregnancy, delivery of the baby, and its early childhood. Medical progress in these critical factors continues to be made through research.

Pregnancy represents an important responsibility to the next generation. Young people are advised to have a complete physical examination before marriage and to correct any physical defects which would influence children born to them. If inherited disorders are suspected, the doctor can recommend advice from a specialist in genetics. Planning for parenthood can contribute to preventing damaged children.

A pregnant woman should have medical attention throughout her pregnancy for her child's protection as well as her own. Modern obstetrical care, skillful child rearing, and proper child health care including immunizations against contagious diseases are all important measures in preventing minimal brain dysfunction.

## *diagnosis: who makes it? how?*

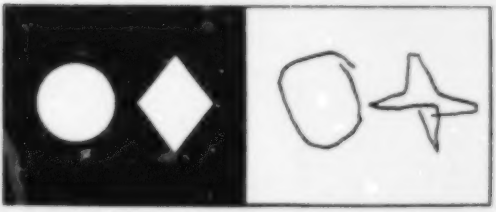
Who is to diagnose and treat the child with learning disabilities due to MBD?

The family doctor, the pediatrician, or the pediatric neurologist may all play a part in the medical diagnosis of the child. A complete medical history and physical examination is the start. A full check of vision and hearing by appropriate specialists is important. Glasses or a hearing aid should be used if the diagnostic studies indicate that they would be beneficial.

When advisable for diagnosis, the physician may request a variety of special medical tests. For example, an electroencephalogram (EEG) sometimes is recommended. This painless record of the electrical activity within the brain cells often is performed for children who have had

seizures. For those with learning disabilities which might be due to MBD, there are two different medical points of view. Some specialists consider an EEG helpful in certain cases but not required for all children with learning disabilities. Other specialists, particularly those who are conducting a research study, may schedule an EEG for all children as part of the process of gathering all facts with a possible bearing on the learning problem. In one such study, a kind of abnormal brain wave which differed from the abnormal brain waves in epilepsy was found in EEG studies in 2.3 percent of a group of 1,000 normal children, and in 10.2 percent of children with symptoms involving the brain and spinal cord.

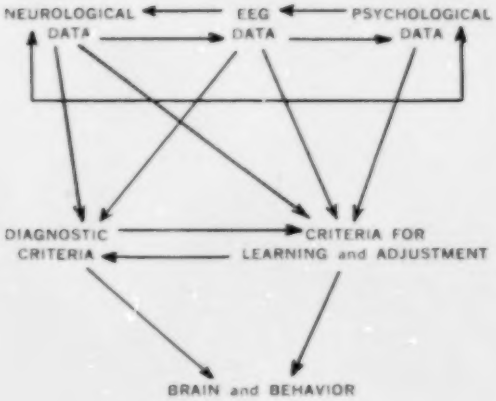
Equally important as the medical diagnosis is an "educational diagnosis." This includes an analysis of the child's school record, psychological tests, and an evaluation of his speech and language development.



Difficulty in copying geometric figures suggests confused brain perception.

Research proceeds on screening tests designed for all children. This is leading to more effective ways to select those children who need a more intensive educational evaluation because of possible MBD.

Children with learning disabilities due to minimal brain dysfunction may be found among the poor spellers. Specialists determined that spelling is a sensitive indicator of learning ability (or disability). Spelling requires the child to listen and to look. Then he must combine the



brain systems of hearing and seeing into the idea of a word. The child next must have the brain direction and the muscular coordination for writing the desired word.

These children also may be found among those having trouble with arithmetic. Success with arithmetic requires accurate perception, clear understanding, and a good memory. If a child is weak in all or some of these qualities, he needs special teaching methods to learn arithmetic.

Other school groups among which children with learning disabilities due to MBD are being discovered are the "slow learners" and more particularly the "under achievers."

To save parents and child the strain of going to many places for many examinations, more diagnostic centers are being organized. Involved with such a center will be most of these: educators and teachers; the family doctor, a pediatrician, or a neurologist; a child psychiatrist; an otologist or otolaryngologist (for hearing); an ophthalmologist or optometrist (for vision); a psychologist; an EEG (electroencephalogram) specialist; a language therapist; an audiologist; a social worker or public health nurse for community resources; a researcher in child development; a biomedical engineer for the intricate electronic equipment of a research center.

Admittedly there aren't enough specialists and diagnostic centers for children whose learning disabilities might be due to MBD. A diagnostic and treatment center is costly, but cheaper than the cost to society of supporting a person who might never be independent. Meanwhile, the family doctor and the school cope with most children with learning disabilities due to MBD as best they can, with the aid of such specialists as are available.

## *the child with MBD can be helped*

Various approaches to helping the child improve his performance in behavior and learning must be tried, at the earliest age at which a diagnosis of minimal brain dysfunction is made. Parents who have other children must decide

A special teacher

Tuto

how much time and money can be spent on the MBD child in fairness to the needs for time and money of their other children.

First, of course, is to achieve the maximum physical health under the guidance of the child's doctor. For some MBD children, no presently known medicine appears helpful. Oddly enough, an overactive child with minimal brain dysfunction may become wildly excited on the light doses of phenobarbital which act as a sedative for other individuals. On the contrary, he may quiet down to the point where he can study in regular classes when certain stimulants are prescribed by his doctor and taken regularly. Children who have had seizures or whose EEG records show a borderline problem with overactive brain waves may improve remarkably on one of the antiseizure medicines. MBD children need extra guidance to avoid the accidents to which they are prone, particularly when riding a bicycle or, at an older age, when driving a car.

Next, they usually need special teaching and living methods. But effective programs and pre-

ing

Two cubicles in a regular classroom.

pared teachers are far too few. Parents are seeking the legislation for special public school programs and for preparing special teachers.

Three kinds of classes for children with learning disabilities due to minimal brain dysfunction have proven their worth: Two or three schools may share the time of an itinerant teacher. Depending upon the MBD child's needs, a resource room may take him from his regular class for 2 or 3 hours daily of special instruction. Or, a self-contained classroom may provide the entire program for MBD children.

The teaching method for the individual MBD child depends upon whether his main disability is primarily of the auditory system or the visual system. The auditory system must "process" the sound and the visual system must "process" the sight: take in the sound or sight, interpret it in the brain and remember it, and respond appropriately. The key ideas are input, brain integration, and output.

Children with auditory-type MBD require dif-

ferent kinds of teaching than the child who is hard of hearing or deaf. For example, the MBD child may confuse such words as "coal" and "cold." Children with visual-type MBD require different methods of teaching than the partially or totally blind child. To such a child a capital B may come apart in his brain to look like 13: 1 3. Consequently, one of the ways to recognize the child with learning disabilities due to MBD is through his efforts at writing. The child who reads and listens well but has trouble writing may be tested orally until special lessons improve his ability to write.

## *family plans for the MBD child*

With the most skilled assistance available, an individual program should be worked out for the child, setting realistic goals, year by year. A school advisor, the family doctor, or a voluntary association may help the parents locate any community resources for these children.

Not all children with learning disabilities due

to MBD are overactive. But for the many who are, suggestions for simplifying life may be helpful. Any limitations should be checked and rechecked with the doctor who supervises the child. The danger of understimulation and social deprivation must be kept in mind for the overactive child on limitations as well as the underactive child. Any child should be reassured that limitations are a sign of the love and concern of his parents and teachers, and are not a punishment.

In general, the overactive child behaves and learns best in a simple, uncluttered, calm environment with short-range goals and few distractions. If he starts an activity well but soon becomes messy or destructive, a program of "quality not quantity" may be set up. The adult who learns to recognize signs of stress in the child can change the activity before the child acts explosively.

***dressing***

Some MBD children lack the ability to place things in sequence and may need to learn to dress step by step. One garment is offered at a time, always in the same order, with the same words. Because they may have trouble with right-left, a mark the child can recognize on all right sleeves or legs or shoes may help him.

***eating***

These children may be mouth stuffers because they cannot judge quantities. They may spill for the same reason or because they lack simple hand skill. They may throw food because they are confused with many objects. One food and one spoon may be all an MBD child can manage at one time.

***furnishings***

Some children with minimal brain dysfunction are comfortable with the usual bedroom furnishings. But others find patterns in wallpaper or rugs, even pictures on the walls, over-stimulating. They act most normally in a room with plain walls and floors, and only the necessary furniture. Other items may be kept in the closet where they will not distract the child.

***games and play***

Games and play help a child in many ways—to improve his coordination, to judge weights and distances, to learn suitable behavior. Games may be difficult for MBD children who do not easily learn sequences and variations. But many games can be broken into a series of steps ("structured"). Conquering these steps represents real success for the MBD child, bringing happiness and confidence.

***speech and language***

Correct sequences also are required in learning language. If a child with minimal brain dysfunction has trouble learning to talk, some speech therapists have been able to teach him sound by sound until he learns whole words. The adult who is uncertain about a foreign word and wants it broken into its separate sounds can sympathize with this approach.

***trips for recreation and education***

Some parents encounter behavior difficulties when they take an MBD child somewhere. They may find ideas they can adapt from the experi-

A research EEG is made of a baby's brain waves at an NINCDS collaborating center.

ence of a teacher who is specially educated in teaching children with learning disabilities due to MBD. She admits that the strain on her was greater when she took four distractible children to the zoo than when she took 30 normal youngsters.

She schooled the students in advance. "We will take 6 steps and STOP. We will take another 6 steps and STOP." They practiced this in school.

At the zoo, they counted out 6 steps and stopped. Here were wonders! They stood still to look at them. They counted another 6 steps and stopped. The scene had changed only slightly, but the change was all that they could handle without wildly over-reacting emotions.

### *believe in the child's success, now and later*

Children catch feelings like they catch the mumps; they catch anxiety and fear about themselves from parents, even though no words of worry are heard. Praise for the smallest of immediate successes will help both parents and child to change negative worry feelings to positive calm confidence in the future attainment of the child's potential.

## *research in learning disabilities due to MBD*

Both private and public organizations are contributing money and effort in the hope of progress through research on the troubling problems of children with learning disabilities due to minimal brain dysfunction. This research involves a number of fields, including education, medicine, and psychology.

The Collaborative Perinatal Study, a nationwide investigation of 55,000 pregnancies and the resulting offspring, was supported by the National Institute of Neurological and Communicative Disorders and Stroke at 12 medical centers from 1959 to 1965. The mothers were observed through pregnancy, labor, and delivery; the children until they were of school age. It is hoped that the Study data, now being analyzed and interpreted, will result in clear evidence for certain causes of conditions of pregnancy, and ultimately lead to measures for prevention of birth defects.

The basic research programs of NINCDS and other Government and private institutions on the structure and function of the brain and nervous system abound in possibilities for practical discoveries.

The results of a three-phase study of the problems of children with minimal brain dysfunction are available. The study was initiated in 1963 under the joint sponsorship of the Easter Seal Research Foundation and the U.S. Department of Health, Education, and Welfare. NINCDS performed a major service in this endeavor.

The findings of the study are published and distributed by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. (Prices of copies: Task Force I, Minimal Brain Dysfunction in Children, Terminology and Identification, $1.55; Task Force III, Central Processing Dysfunctions in Children: A Review of Research, $2.25.) Copies of Task Force II, Minimal Brain Dysfunction in Children—Educational, Medical and Health Related Services are available from the National Easter Seal Society for Crippled Children and Adults, 30 cents.

## *who is helping?*

Parents of children with minimal brain dysfunction cannot wait for complete scientific answers. They have problems to solve today, and they already are acting in groups to solve these problems. They are raising money for medical research and direct service, and gaining community understanding for their children.

An increasing number of State departments of special education are developing programs for the MBD child. Universities are cooperating in preparing special teachers and diagnosticians to carry out these new programs.

The Association for Children with Learning Disabilities (ACLD) is a nonprofit organization of parents, professionals, and other interested persons with some 300 chapters through its affiliates. The Association is increasing public understanding, stimulating improved school and community services, and sponsoring meetings. ACLD publishes a newsletter and annual conference proceedings. General queries and questions on resources may be sent to ACLD, Mrs. Sandra Harrison, 5225 Grace Street, Pittsburgh, Pennsylvania 15236. ACLD's bi-monthly newsletter is $3.50 for 1 year.

Children are tested from birth to school age in collaborative research with NINCDS.

Spelling and drawing difficulties improve with four months' tutoring.

The National Easter Seal Society for Crippled Children and Adults stimulates and sponsors research, and alerts and informs professional personnel. It sponsors seminars, workshops, institutes, and symposia, and offers special training through scholarships and summer courses, for specialists in the field.

The National Easter Seal Societies throughout the country provide many services which include information and services available for the children with learning disabilities due to MBD. Pamphlets and articles for professional persons

or parents may be obtained from The National Easter Seal Society at 2023 West Ogden Avenue, Chicago, Illinois 60612.

Government agencies, various concerned professional organizations, and centers for children with neurological disorders are putting increased emphasis on recognizing and solving the difficulties of children with minimal brain dysfunction.

As mentioned previously, the National Institutes of Health and the National Institute of Mental Health, both of the Department of Health, Education, and Welfare, are supporting research on minimal brain dysfunction in children.

The U.S. Office of Education publishes *American Education*, a readable magazine on all aspects of education. Articles already have discussed problems of classrooms and teaching for children with learning disabilities due to minimal brain dysfunction. Subscriptions are $13.50 a year through the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

You may wish to write to "Closer Look," Box 1492, Washington, D.C. 20013. This is a computerized Special Education Information Center which prints out names and locations of private and public schools, institutions and clinics where special education facilities may be available nearest the home of any child or young adult.

Teachers will find articles of interest in the journals, *Exceptional Children*, and *TEACHING Exceptional Children*. These journals are part of the overall program of the Council for Exceptional Children, 1920 Association Drive, Reston, Virginia 22091.

Children and adults with learning disabilities that prevent the reading of regular print materials may be eligible for the free talking book service of the Library of Congress. Write: Division for the Blind and Physically Handicapped, Library of Congress, 1291 Taylor Street NW., Washington, D.C. 20542.

## *hope through research*

Parents, friends, and professional persons know that the problems of the child with learning disabilities due to minimal brain dysfunction are not hopeless. The child can be found, and he can be helped.

NIH Clinical Center as seen from the rose garden.

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